

Lighting Energy Savings Opportunities in Hotel Guestrooms

EXECUTIVE SUMMARY

Results from a Scoping Study at the Redondo Beach Crown Plaza

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A study was conducted by LBNL/DOE in order to better understand the lighting usage and energy consumption patterns in typical hotel guestrooms. This involved a multi-phase research, development and demonstration program. This program started with the identification and characterization of common lighting technologies in hotel guestrooms and ended in the measurement and monitoring of newly developed and existing technologies at a hotel test site.

The objective of this research project was to gather information on how lighting is used in typical hotel guestrooms in order to identify the savings potentials that energy efficient technologies could present. To this end, data was collected on all lighting fixtures in 10 guestrooms at a hotel test site to determine how much total energy was used for lighting and where the lighting energy was used the most. This data was used to determine what the energy saving potentials were offered by CFLs and occupancy sensors.

A significant finding in this study is the relatively high usage and energy impact of the bathroom lighting. While many bathroom fixtures are already fluorescent, significant energy savings could be achieved through the integration of occupancy sensors in bathrooms due to the substantial burn hours of these fixtures. Because of their high wattage, incandescent bathroom fixtures offer extraordinary energy savings for occupancy sensors at nearly \$40 per fixture per year. But even fluorescent bathroom fixtures could save nearly \$10 a year with the addition on an occupancy sensor. Integration of a bathroom lighting controller/occupancy sensor can present energy savings that rival those achieved by retrofitting all table and floor lamps with CFLs, with a much lower initial investment. Assuming that 90% of the 15 million U.S. hotel rooms already have fluorescent bathroom fixtures, an additional 2-3 billion kilowatt-hours annually can be saved with occupancy sensors that simply shave off the “on periods” greater than 4 hours.

In most cases a simple payback of less than 2 years can be achieved by replacing incandescent lamps with CFLs in table and floor lamps. Many hotels have recognized the energy saving potential of CFLs and mandated their use in all their facilities. But as many as half of the 15 million hotel rooms in the U.S. still use incandescent lamps in the table and floor lamps. If these remaining potable fixtures were re-lamped with CFLs, the annual national energy savings would be 3-5 billion kilowatt-hours.

Additional research should be conducted on a larger scale and in hotel environments different from Redondo Beach in order to verify these findings. Also, it is critical to obtain user survey information in order to determine the acceptance of these energy saving technologies by the hotel guests. Hotel managers are understandably very reluctant to accept new technologies that they perceive will sacrifice the quality of the guestroom environment – even if the new technology promises to save them money. While more information needs to be gathered, it appears that there are significant energy savings opportunities in hotel guestroom lighting.

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